

Editorial

Mudflats: The Cradle of Life

The purported aim of the National Biodiversity Action Plan of the Government of India is to protect all species and all types of habitats. However, in the priority list of the Ministry of Environment & Forests and the State Forest Departments that look after all Protected Areas (PA), mudflats do not find any mention as if they do not exist. With nearly 7,517 km coastline, including 5,423 km in mainland India, and 2,094 km in the Andaman & Nicobar and Lakshadweep Islands, mudflats are present in almost all coastal states, but if you ask PA Managers, many may have not even heard of them, and even if they know about some mudflats it is generally with a negative attitude, much like most of them have for the so-called 'wasteland'. Actually, most mudflats are listed as wastelands in revenue records. According to the Indian Naval Hydrographic Department's data, the mainland coast consists of 43% sandy beaches, 11% rocky coast including cliffs, and 46% mudflats. There are 61 coastal districts and one-fifth of India's population lives along the coast. Gujarat has the largest coastline in India. While the western coastline of India has a wide continental shelf and is marked by backwaters, large intertidal zones and mudflats, it is the flat east coast of India where the Gangetic, Mahanadi, Godavari, Krishna and Cauvery deltas support huge mudflats.

According to Collins English Dictionary, "mudflats are areas of flat empty land at the coast which are covered by the sea only when the tide is in." Another definition of mudflat is "a low-lying muddy land that is covered at high tide and exposed at low tide". Mudflats are mostly found in areas where the tidal waters flow slowly, such as flat coastline, sheltered bays and estuaries of large rivers. Alluvium from large rivers as they reach the sea, and silt from tidal water intermingle, depositing layers of mud, thus creating mudflats. Some scientists consider the Rann, both the Great (18,000 sq. km) and Little (5,100 sq. km), of Kachchh as the largest mudflats in India, inundated during the monsoon by sea and rainwater.

In areas where the mudflats are deep and stable, and can support vegetation, salt marshes and mangrove swamps are formed – both highly important biologically. It is said that such coastal domain, consisting of mudflats, intertidal zones, salt marshes, and mangroves are the nursery of fish and supply almost 90% of the world's fish catch. Millions of Indian fishermen are dependent on these ecosystems that are mostly considered 'wastelands' in government circles, and are treated as prime areas for reclamation and development. Even well-intentioned initiatives to increase mangrove cover sometimes destroy mudflats, as can be seen in several coastal states of India. In a paper by Samson and Rollon (2008), based on surveys of 70 mangrove restoration sites in the world, it was shown that most of them failed because the sites selected were mudflats, sandbanks or seagrass meadows that could not support mangrove vegetation, as ecologically some of them have not co-evolved to support mangroves. In India also, particularly on Gujarat and Maharashtra coastlines, there is a scramble to plant mangroves. Sometimes the only areas available are open mudflats, which may or may not be suitable for the growth of large trees. The irony is that such misguided attempts damage otherwise healthy coastal mudflats.

The Ministry of Earth Sciences, Government of India, and ICMAM Project Directorate, Chennai, have identified 18 sensitive coastal areas of India, especially for oil spills. Many of these areas are intertidal zones, mangroves, and mudflats. Gulf of Khambat, Gulf of Kachchh, and the mudflats and beaches of Dwarka in Gujarat; extensive mudflats of Sewri and Thane in Mumbai, Gulf of Mannar and Vedaranyam Swamp of Tamil Nadu; Naupada Swamp and mudflats of Andhra Pradesh; Bhitarkanika mangroves, mudflats, and sandy banks around Chilika lake in Orissa, and Sundarbans in West Bengal are some of these sensitive areas. Special mention must be made of the unique mudflat that is the breeding ground of Horseshoe Crab along the Chandipur and Balramgadi coast of Orissa, where during low tide the sea recedes almost 5–6 km to expose one of the widest mudflats on the east coast of India along the Bay of Bengal.

The exposed mudflats, with their rich marine fauna in the form of crabs, fish, algae, polychaetes, molluscs, crustaceans, etc., attract millions of birds. Some of the rarest Indian birds are dependent on mudflats and intertidal

zones. For example, the Critically Endangered Spoon-billed Sandpiper *Eurynorhynchus pygmeus* is totally dependent on mudflats for foraging in its winter quarters in India, Bangladesh, and Myanmar. Open mudflats with shallow water and soft mud accumulated in ripples are the ideal habitat of Spoon-billed Sandpiper. The Spoon-billed Sandpiper has a naturally limited breeding range on the Chukotsk peninsula and southwards along the isthmus of the Kamchatka peninsula, in north-eastern Russia. It migrates down the western Pacific coast through Russia, Japan, North Korea, South Korea, mainland China, Hong Kong, and Taiwan, to its main wintering grounds in South and Southeast Asia, where it has been recorded from India, Bangladesh, Myanmar, Thailand, Vietnam, Philippines, peninsular Malaysia, and Singapore (BirdLife International 2001). Perhaps less than one thousand individuals of this tiny migratory bird are left in the world (BirdLife International 2011). In India, it has been reported only from Chilika and Point Calimere, with possibility of its occurrence in Sundarbans (Rahmani, *in prep.*). Another globally threatened bird found in India is Spotted Greenshank *Tringa guttifer*, earlier known as Nordmann's Greenshank, listed as Endangered by BirdLife International (2011) and IUCN that stated "it has a very small population which is declining as a result of the development of coastal wetlands throughout its range, principally for industry, infrastructure projects and aquaculture." It is a rare winter visitor to India with confirmed records only from Point Calimere and a few questionable old records from Assam. Among the Vulnerable category of birds in India, Great Knot *Calidris tenuirostris* is the one that is dependent on mudflats and coastal beaches. It is a rare winter visitor to the east coast of India, with regular sightings from Point Calimere, Pulicat lake and Marine National Park in the Gulf of Mannar, Chilika lake, Bhitarkanika and Sundarbans (Rahmani, *in prep.*). It breeds in Siberia from May to June-July on open, lichen-covered gravelly ground, with stunted bushes and herbs. During migration and in wintering areas, it is usually found in estuaries, coasts, sandy beaches, mudflats, and mangroves. Besides these globally threatened Indian species, there are up to 40 species of common birds that depend totally or partially on mudflats for foraging and resting. Mudflats provide foraging sites for a few gull and tern species when they are inundated. The exposed areas of mudflats are roosting sites for thousands of terns, gulls, and ducks.

Strings of mudflats play an important role as stopover sites for migratory birds to refuel for the long journey to their wintering or breeding destinations. If mudflats are destroyed or degraded/alterd for developmental activities, such as construction of ports, fishing harbours, industries, oil exploration, plantations, including mangroves and aquaculture, bird migration is disrupted and eventually the birds die due to lack of energy to continue their quest for their traditional breeding grounds. Therefore, it is not enough to protect just a few mudflats in isolation, such as in Sundarbans and Point Calimere, but we need to protect them all along our coastline. The onus of understanding, documenting, and conserving coastal mudflats in India is not only on the Ministry of Environment and Forests, Government of India, forest departments of maritime states, academics and NGOs, but also the state maritime boards, who jealously own and encompass most mudflats for creating new citadels in the form of ports and harbours and Special Economic Zones. What is needed now is a new assessment of the status of our coastal mudflats by the Chief Naval Hydrographer of India. Would they still be 46%?

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